Market
Analysis and
Planning
Services
(MAPS)

U.S. Information Services Industry-Specific Markets 1987-1992

Federal Government Sector

INPUT®

1280 Villa Street, Mountain View, CA 94041 (415) 961-3300

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U.S. INFORMATION SERVICES INDUSTRY-SPECIFIC MARKETS 1987-1992

FEDERAL GOVERNMENT SECTOR

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Exhibits

Issues, Trends, and Events

Issues, Trends, and Events

While the federal government market will continue to grow, the pace will be more moderate in the near term in response to deficit control efforts. The need for the government to improve the quality and quantity of ADP-supported services under these constraints presents unique opportunities for vendors. (Note: The abbreviation "ADP," which is used commonly in the federal government and throughout this report, refers to Automated Data Processing and is analogous to EDP (Electronic Data Processing).

The key forces that will impact this market are:

- Current administration and congressional measures to reduce the federal budget deficit will reduce expenditures for ADP services in 1988 and 1989.
- The federal workforce remains heavily committed to maintaining existing systems and is inadequately staffed to develop needed new and replacement systems.
- Initial budget cuts will affect vendors as agencies protect in-house staffs, but future service needs will be met by the increased use of service contracts.
- Wary of late delivery and/or cost overruns, federal agencies are now moving toward increased vendor risk-sharing contracts and service guarantees.

A Budget and Personnel Constraints

The federal government has a need that extends into the 1990s to steadily improve the quality and quantity of ADP services. This must be done, in part, by overcoming the handicap of a rapidly aging Automatic Data Processing Equipment (ADPE) inventory. However, escalating costs for hardware and software and the constraints applied by budget and personnel reductions make the goal that much harder to achieve.

The federal government does not currently have the in-house staff necessary to support the quality or quantity of ADP services required. When the federal government does not have the capability to perform work with in-house personnel, it contracts the work to outside services vendors. There are strong indications that the government will make increasing use of services contracts beginning late in 1988 and continuing through the remainder of this decade.

However, government spending has exceeded revenue receipts in the last several years. If left unchecked, the shortfall could top $169 billion in 1988, jeopardizing funding requests for contracted services.

To reduce the deficit, Congress passed the Balanced Budget and Emergency Deficit Control Act of 1985—better known by the names of its primary sponsors, Gramm, Rudman, and Hollings (GRH). GRH requires elimination of the federal deficit by 1991. To meet this goal, spending in 1988 must be reduced by 5.3% for civilian programs and 5.6% for all military programs.

Although the future application of GRH cannot be forecasted, federal agencies indicate some likely directions with respect to information technology obligations.

- At the very least, GRH signals a halt to acquisition of new hardware "because it's there." Agency managers at all levels will now be required to rethink their productivity improvement plans and prepare to provide credible evidence to a top-level review council that the proposed acquisitions will indeed provide benefits (read "cost savings") that could not be as readily achieved via other strategies.

- For some agencies, meeting GRH deficit reduction levels will require spending cuts of varying magnitude from travel restrictions and training and support reductions to limitations in the number of planned equipment purchases on a given contract.

- A third response may be to stretch out programs and/or combine second-tier programs with other, more beneficial first-tier programs. This approach will be embraced particularly for initiatives that meet deficit reduction objectives but do not deliver the short-term benefits. A variation on this approach may result in the restructuring of proposed initiatives. Several agencies stated that they are now considering restrictions of their current hardware suite and/or scaling back the hardware component of initiatives that are about to get underway.

Agencies have made a number of procurement decisions at this point. The applicability of GRH, in terms of the specific dollar reductions required at the subagency level, has led to a "wait and see" posture. As one respondent put it, "Given time, Gramm-Rudman may go away, and if it doesn't, at least the reduction requirements will be clear."

B

Maintaining Existing Systems

Much of the existing inventory of ADPE lacks flexibility, transaction speed, and memory to satisfy current and future requirements. Most of the current or planned acquisitions are aimed at upgrading this equipment and converting or replacing the software systems associated with the equipment.

- With massive upgrade efforts underway and support requirements likely to plateau, many agencies believe this is a time to rethink the progress to date and reaccess whether the progress has resulted in improvements in the way the government does its work. Are agencies producing the required information, and only that information, and is there a clear movement from data to information technology?

An objective of the upgrades, of course, is reduction of the long-term costs of maintenance and software development. The Government Accounting Office (GAO) has estimated that 70% of the federal government's life cycle costs of software are related to maintenance.

- As more software is developed by the government, more software maintenance will be required to keep that software functional. But more flexible hardware, coupled with the use of modern software (standard packages, disposable software) and productivity aids, may offset the costs associated with the increased need.

- One alternative course of action has been the exemplary program of standardizing languages within the DoD. Among federal agencies, DoD has witnessed a proliferation of software at the same time the programmer force has been shrinking. To reduce the rate of growth of software development and maintenance costs, DoD is seeking productivity improvements by using fewer languages.

C

Federal Regulations and Policies

Contracted services are acquired under a variety of regulations. In an attempt to expedite the federal acquisition process, which can take as long as two years for major acquisitions, and to provide a single set of procurement procedures, the Federal Acquisitions Regulations (FARs) were adopted in 1984. The FARs regulate procurement of goods and services not included under the Federal Information Resource Management Regulations (FIRMRs). The FARs also apply to ADP and Communications for the acquisition of:

- Mission-critical computer resources of DoD.
- Public-oriented systems such as air traffic control and biomedicine.
- Classified systems of the intelligence community.

The FIRMRs, also taking effect in 1984, provide a single regulation for the acquisition, management, and use of general-purpose information

technology (ADP and telecommunications) by combining FPRs, FARs, and FPMRs.)

The Competition in Contracting Act (CICA) of 1985 provides expanded legal powers for ADP protest action via GSA Board of Contract Appeals and GAO, increases the opportunity to employ negotiated contracts, and establishes seven more restrictive categories of exceptions that permit sole-source awards.

The Small Business Equal Competition Act (SBECA) of 1984 requires publication in the Commerce Business Daily (CBD) of an agency's intent to award sole-source contracts or GSA's intent to modify FIRMR or FAR in a manner that would require an increase in paperwork or eliminate competition from small businesses.

The OMB A-109 policy is still in effect, but only for larger ($100-$500 million) contracts or acquisition of "controversial" systems. The A-109 acquisition procedure requires early participation of potential prime bidders and some of the principal first-tier subcontractors.

There are several other policies that also impact services acquisition practices:

- OMB Policy A-76 (Policies for Acquiring Commercial Industrial Products and Services Needed by the Government) recommends government reliance on the private sector for goods and services. This policy has now become the administration's Productivity Improvement Program (PIP), putting even more emphasis on cost-effective performance of ADP and other services.
  - The policy requires a comparison of the cost of in-house staff and contractor performance of services (including professional services) whenever an agency plans a major upgrade, replacement, or start of ADP resources. This comparison is an attempt to determine if in-house is, in fact, cheaper than commercial acquisitions.
  - OMB A-76 comparisons are usually applied to facilities management and site operation and maintenance contracts, and rarely to system design and software development projects.
  - To gain efficiency, the policy supports transition from the earlier "body-shop"-type contracting. Under the latter, the vendor determines the staffing needs and skills mix to perform the tasks.
- The Defense Appropriations Act of 1984 included a "Buy-Not-Lease" mandate. Although the DoD mandate was not fully funded in GFY 1984-1987, it could have far-reaching implications in DoD where more than $1.3 billion of currently leased ADPE still remains to be replaced in the next three years.

- The mandate dictated competitive acquisition of replacement systems where the purchase option would acquire obsolete equipment. Professional services vendors could be asked to bid system design and system integration opportunities.

- Because of the additional funding that would be directed toward purchase of equipment, one possibility is a slowdown in the upgrading process to new, more modern equipment and an increase in the amount of maintenance required to keep obsolete equipment (and the software designed to run on that equipment) operational until replacement.

- Competitive replacement of leased systems could also offer opportunities for code conversion, new software development, and training.

Reduced emphasis on the use of small businesses, in particular the 8(a) program, has eroded the small business share of government contracts, as shown by the drastic decline of contracting by the Departments of Education, Health and Human Services, and Labor, according to the House Small-Business Committee. The inclusion of a small business subcontracting plan in large ADP system bids is required by DoD, NASA, and Transportation.

Four federal agencies (the Department of Agriculture, the Department of Health and Human Services, the Department of the Navy, and the National Aeronautics and Space Administration) have agreed to participate in the General Services Administration "Go for 12" Program.

- The program is designed to streamline the lengthy process required for the acquisition of automatic data processing and telecommunications resources to a point where major systems acquisitions are accomplished within a 12-month period.

- Each agency will work with GSA in one of three pilot projects designed to model and test different aspects of the acquisition process.

- The three aspects of the program are:

  - Elimination of unnecessary bottlenecks in the acquisition process.
  - Potential for parallel review of acquisitions.
  - Provision for special training in ADP and telecommunications acquisitions.

D

Advantages and Disadvantages of Contracting

Vendors provide services to the government under a variety of contract types.

- Cost-plus contracts provide for vendor costs to be paid and a fee added that is either negotiated (cost-plus-fixed-fee) or based upon the per-

formance of the contractor in satisfying the contract requirement (cost-plus-award fee). Cost-plus contracts regulate the margin of profit allowed, but clearly place the risk with the government.

- Fixed-price contracts commit vendors to perform and complete a contract at a predetermined price ceiling. To a significant extent, the profitability associated with a fixed-price contract is dependent upon the vendor's ability to accurately appraise, in advance, the cost of providing services. Managing fixed-price contracts successfully requires an extremely well written and detailed statement of work and project scope. The risk of completion is placed on the vendor.

- Level of effort (LOE) or time and materials (T&M) contracts provide for an hourly billing plus the reimbursement by the government for travel, supplies, equipment, and other materials required to satisfy the terms of the contract. In many competitive situations, vendors are required to combine their contract with a "not-to-exceed" clause that essentially imposes cost ceilings on the contract.

There will be a continuing emphasis on fixed-price contracting,, especially in software development, but there is also a general drift to cost plus award or incentive fee (versus fixed-fee) to control project schedule slippage. Many agencies use cost-plus in early and/or difficult stages and then make the transition to fixed-price when the solution is set.

The major reason the civil agencies and DoD use outside contractors is because the contractors provide experience and expertise that are not available internally.

- Professional services contracts in particular are used because they give the agency the ability to balance workloads without increasing or decreasing government staff as requirements are added and/or removed.

- Some government respondents believe that contractor labor is less expensive than performing the same task with government employees, especially when fixed-price contracting enables the government to put a ceiling on the overall cost.

- Objectivity, which includes the ability of the contractor to take an unbiased approach to a problem without being affected by internal agency politics, is a less important benefit.

- The civil agencies consider expediency advantageous. Expediency, in terms of accelerated schedules and fewer problems with government rules, regulations, and policies than if the work were to be performed in-house, is considered a benefit of outside contracting. This judgement is particularly true in civil agencies that have fewer in-house personnel than their DoD counterparts.

The primary disadvantage agencies see in using service vendors is the complexity and senior staff demands for managing contracts. Other disadvantages include:

- Performance risk, or the concern on the part of government agencies that the contractor will deliver an acceptable product on time.
- The problems associated with procurement, including the long lead time required for contracting and the risk of protest by losing bidders.
- The learning curve, or the time it takes contractors to "come up to speed" on the problem.

Although the agencies could not accomplish all of their assigned work without contractor support, it is considered by some agencies to be a disadvantage to become dependent on a contractor.

- This agency concern is because contracting for professional services weakens the agency's ability to do further work because the contractor ends up with most of the expertise in this functional area of work. If the contractor does not allow the government in-house staff to build its skills, then when the contractor leaves the expertise leaves. When contracts are recompeted, some loss in continuity can occur if the incumbent is replaced and takes the core staff.

Vendors view the disadvantages and liabilities of contracting for professional services in ways similar to those of the government agencies cited earlier.

- The major disadvantage is associated with the actual procurement process. Vendors consider the government procurement process long and inflexible. They believe the government has a problem evaluating quality versus price, and there is always the threat of protest if the lowest-priced bidder does not win.
- Performance risk is viewed by the agencies as a liability, vendors believe, because agencies are not able to control contractor personnel.
- Contract management is also considered a significant disadvantage. Some vendors state that dealing with the complexities and legal obligations of a contract pose problems.

E

Agency Selection Criteria and Satisfaction Levels

The opportunities for computer services vendors within the federal government segment, while attractive, must be weighed against its competitive characteristics. In this section, the issues surrounding government contracting are presented from a vendor's point of view.

The process of selecting a vendor for a services contract is one of professional evaluation. The bid selection criteria, showing some variation among agencies and even among specific projects within each agency, usually involves, in order:

- Proposed technical solution; that is, the extent to which the proposed solution meets the requirements.
- Vendor reputation for providing satisfactory products and services to federal clients as well as their corporate commitment to providing support during projects and after implementation.
- Risk containment procedures, including adequacy of reporting schemes and progress reports.
- Cost, although this is considered by contracting personnel as a primary criteria only when two or more vendors propose similar approaches and/or equipment. Vendors frequently complain that the government gives "lip service" to total life cycle costs but really buys on the basis of front-end costs.

Although agencies and vendors agree on the order of importance of these bid selection criteria, civil agencies, DoD agencies, and vendors totally disagree on the importance of characteristics of successful contractors.

The largest differences between the rankings of civil and DoD agencies reflect unique characteristics and needs.

- DoD agencies tend to be more price and hardware sensitive than civil agencies.
- To meet the importance of these sensitive issues, DoD is generally willing to reduce its expectations for the vendors' staff and application experience. And, since DoD has a larger, more experienced stable of in-house personnel, this trade-off is not particularly risky for them.
- Civil agencies, on the other hand, generally have smaller, less experienced staffs and need to utilize as much vendor experience as possible and are willing to pay the price.

Although vendors should appreciate these agency differences and reflect them in bid preparation, they must be even more sensitive to the larger differences between their own views of important vendor characteristics and those of the agencies, both civil and DoD.

- Support is often rated as the least important characteristic by vendors, but support is ranked second or third by agencies.

- Vendors should emphasize their support capabilities and performance in their bids. Unfortunately, it is INPUT's experience that most services vendors cannot provide evidence of customer satisfaction since they do not carry out systematic surveys in this area.

The vendor actions resulting from these discrepancies lead agencies to have lower levels of satisfaction than would be desired. DoD agencies, in general, seem less satisfied with the performance of services vendors than do civil agencies. DoD's greatest concerns are missed delivery schedules and cost overruns.

The discrepancies suggest that vendors should become more aware of specific agency needs and adapt strategies to match their capabilities to those needs, rather than attempting to modify the agency needs to meet an available solution.

The continuing federal budget pressures as well as the growing amount of competition have created a price-sensitive market where the winners are working with progressively narrower margins, more tightly controlled overhead, and reduced management structure.

Bid development now requires in-depth pre-solicitation intelligence and early executive management involvement. Companies that fail to accurately assess their prospects find themselves wasting scarce proposal dollars in expensive bidding failures.

Market Forecasts

II

Market Forecasts

The U.S. government is the largest user of information technology in the world. More than 120,000 federal workers currently manage approximately 22,000 medium- and large-scale computers and over 250,000 microcomputers. In 1988, nearly $19 billion will be spent on information technology, about 1.7% of the total U.S. government budget.

Virtually every major federal program depends on productive use of information technology for its success. Not only is information more available today than even five years ago, it is more widely dispersed.

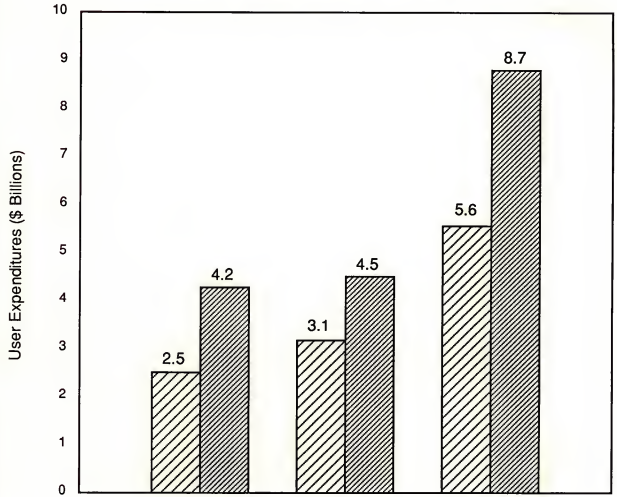
The relationship between the federal government and the developing field of information technology has been a series of hills and valleys. Federal agencies were among the first organizations to develop automated information and service delivery systems, but by the late 1970s the federal government's leadership in computer applications was eroding. Instead, the federal government found itself dependent on systems that were outdated and not cost-effective. Today, the government is in the midst of an important effort to modernize its computer and data processing systems. The changes—both under way and on the drawing board—are dramatic and far-reaching.

The computer services and software portion of the information technology (IT) budget will increase from $5.6 billion in 1987 to $8.7 billion in 1992, an average annual growth rate (AAGR) of 9% (see Exhibit II-1). The defense sector will experience the stronger growth at 11% AAGR, growing from $2.5 billion to $4.2 billion. The civil sector will grow from $3.1 billion in 1987 to $4.5 billion in 1992, an 8% AAGR.

The continuing demand for contracted services is expected to absorb more of the federal IT budget over the remainder of this decade. This growth is reflected in the fact that computer services (processing services, software products, professional services, and turnkey systems) will increase as a percent of the contracted portion of the IT budget from 40%

EXHIBIT II-1

FEDERAL GOVERNMENT: MARKET FORECAST COMPARISON, FY 1987-1992



Note: Expenditures include industry-specific and cross-industry expenditures

to 46% over the forecast period. These specific services and the trends and issues impacting them are discussed below. (Also see Exhibits II-2, II-3, and II-4 for forecasts of the total federal government sector, defense segment, and civil segment, respectively.)

EXHIBIT II-2

FEDERAL GOVERNMENT: INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST BY DELIVERY MODE, FY 1987-1992

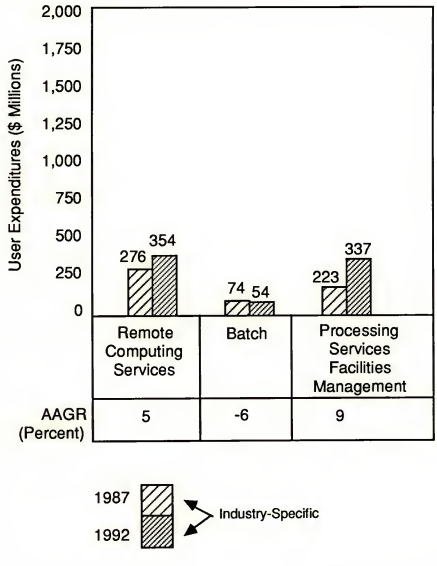


EXHIBIT II-2 (Cont.)

FEDERAL GOVERNMENT: INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST BY DELIVERY MODE, FY 1987-1992 (Cont.)

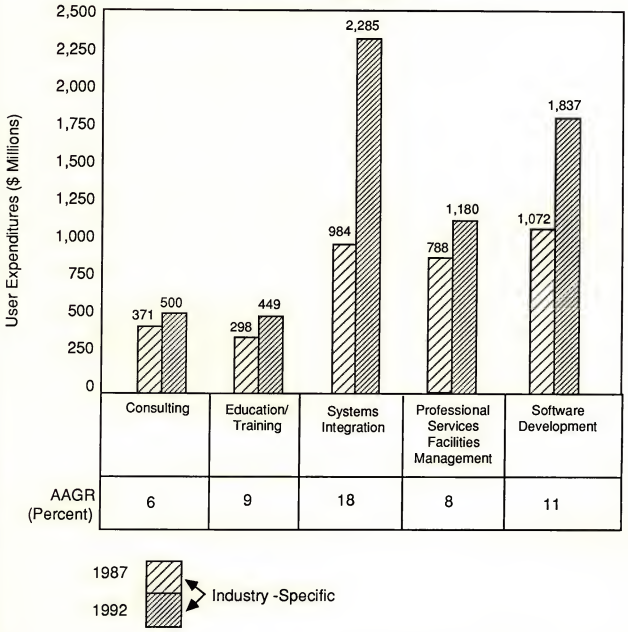
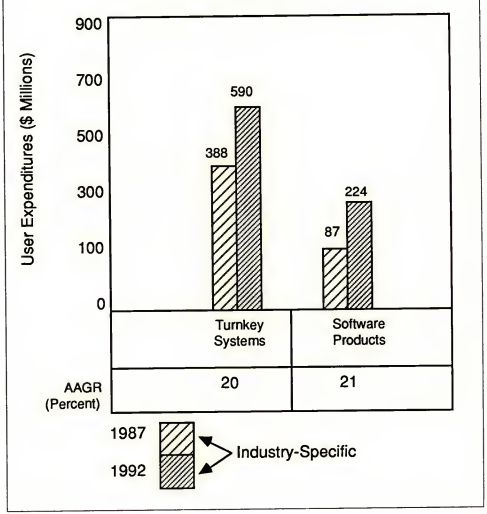


EXHIBIT II-2 (Cont.)

FEDERAL GOVERNMENT: INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST BY DELIVERY MODE, FY 1987-1992 (Cont.)



A

Processing Services

The growth rate of processing services has continued to decline. The forecasted AAGR of 5% to 1992 reflects a downward change in expenditures for batch processing (-6% AAGR), modest growth (9%) in facilities management (PFM), and a slower remote computing services (RCS) AAGR of 5%. Civil sector expenditures are about three times the level of the defense sector, but with slightly less prospect for growth.

- Part of the decline in the size of the civil sector is the result of a new accounting of federal RCS business, which now excludes, in INPUT's

forecast, the payments made by the federal government to the states for contractor-provided medical and compensation claims processing under the Health Care Finances Administration (HCFA) of the Health and Human Services. Since individual states conduct the competition and award the contracts under HCFA supervision, these expenditures are available only through individual states.

EXHIBIT II-3

FEDERAL GOVERNMENT:
DEFENSE SEGMENT USER EXPENDITURE FORECAST
BY DELIVERY MODE, FY 1987-1992

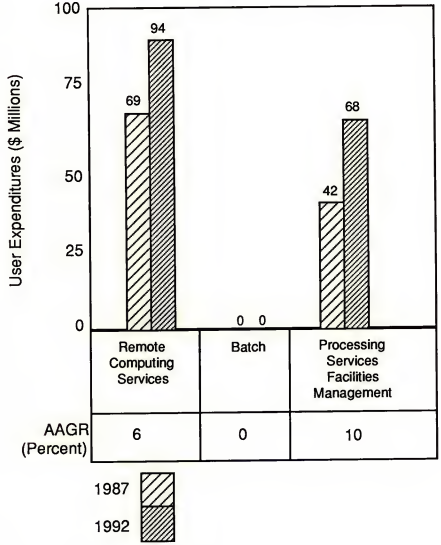


EXHIBIT II-3 (Cont.)

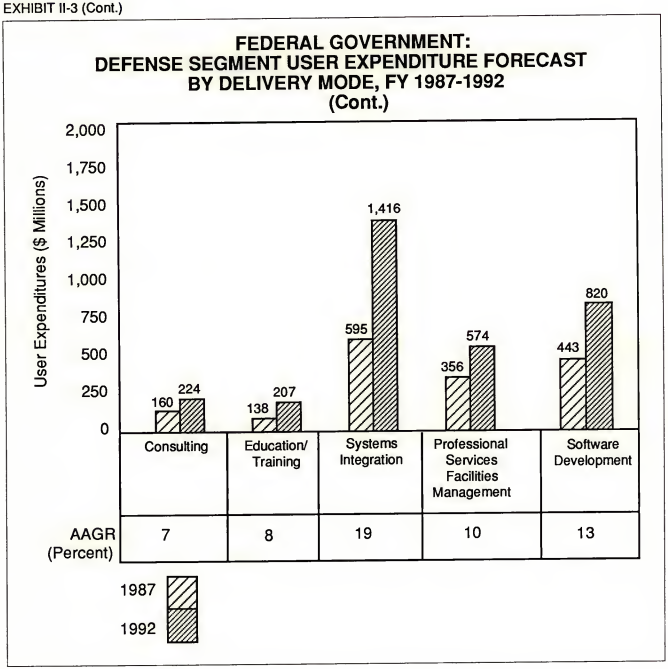


EXHIBIT II-3 (Cont.)

FEDERAL GOVERNMENT: DEFENSE SEGMENT USER EXPENDITURE FORECAST BY DELIVERY MODE, FY 1987-1992 (Cont.)

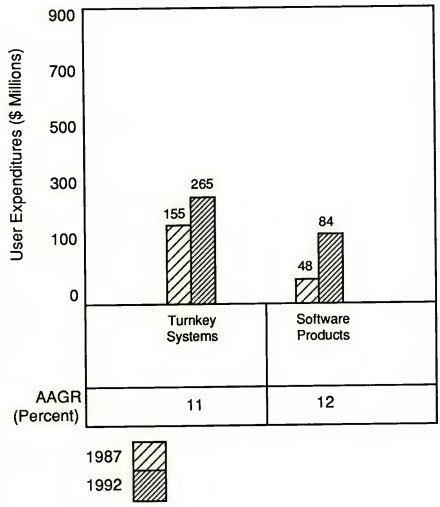


EXHIBIT II-4

FEDERAL GOVERNMENT: CIVIL SEGMENT USER EXPENDITURE FORECAST BY DELIVERY MODE, FY 1987-1992

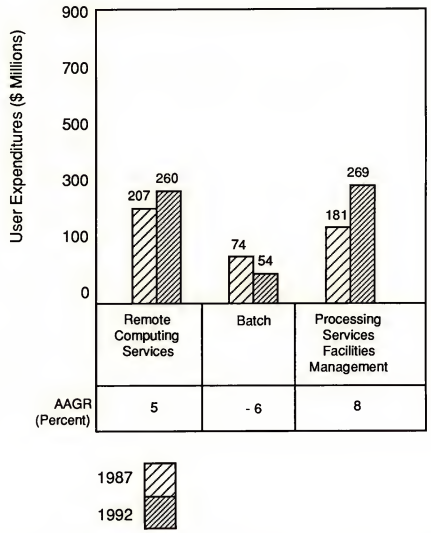


EXHIBIT II-4 (Cont.)

FEDERAL GOVERNMENT: CIVIL SEGMENT USER EXPENDITURE FORECAST BY DELIVERY MODE, FY 1987-1992 (Cont.)

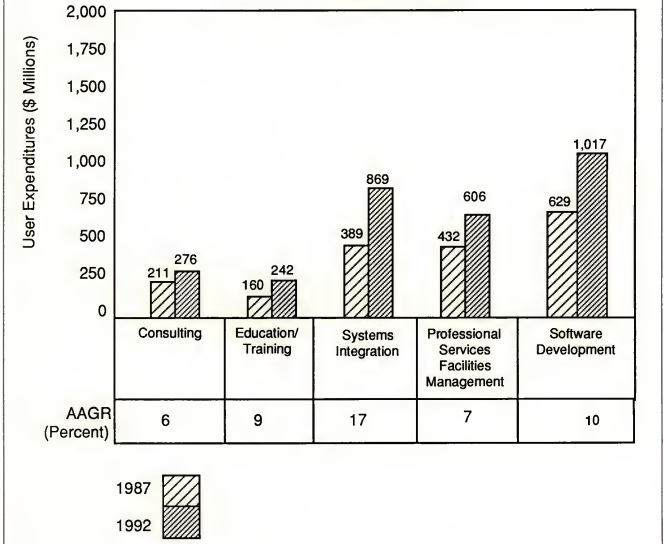
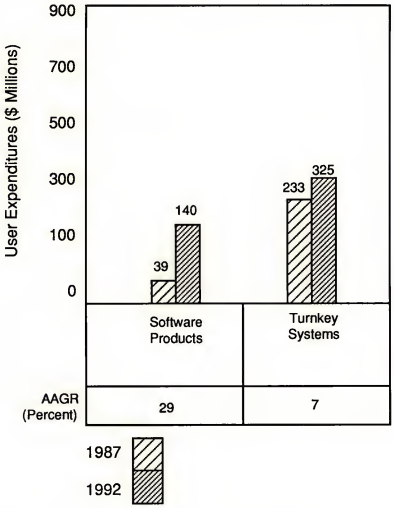


EXHIBIT II-4 (Cont.)

FEDERAL GOVERNMENT: CIVIL SEGMENT USER EXPENDITURE FORECAST BY DELIVERY MODE, FY 1987-1992 (Cont.)



- Since HCFA payments are the only processing expenditures expected to continue to increase, the growth of direct federal processing services will be at a lower rate than previously forecast.

The RCS business has been eroded by several developments:

- The dramatic influx of PCs in the federal workplace has diminished requests for special data manipulation.
  - A PC permits the end user to test various displays without requiring the preparation of task orders.
  - PC networks permit data swapping between end users without data center intervention.
- Perhaps equal in impact on diminishing processing services is the use of PCs by end users in the contracting process itself. Although the GSA has shortened the contracting process from over a year to three to five months, the Teleprocessing Service Program (TSP), including the Multiple Award Schedule (MAS) and Basic Agreements (BA), is generally viewed by agencies as offering a very limited list of potential vendors.
- Although GSA is considering inclusion of VAN and distributed data processing services, under MAS there is no clear indication that users will bear the additional costs of these features.
- Agencies show an increasing preference for purchase of raw computing power under the second part of GSA-sponsored TSP, Basic Agreements.
- The remaining high value that vendors could offer comes from the possible commercialization of existing government data bases.

Batch processing has also fallen prey to microcomputers and similar intelligent workstations. By their nature, batch jobs usually consist of large volumes of data that require minimum manipulation. As such, these jobs are best processed off-line by micro- and mini-based processing approaches. Vendors will need to offer cost-competitive alternatives, such as cheaper workstations, or data acquisition devices.

Processing facilities management (PFM), called contractor-owned/contractor-operated (COCO) FM in the federal government, is a mature market that will remain small but stable into the 1990s. Demand will rise somewhat for an on-line standby capability to provide insurance for catastrophic federal data center failures.

An additional cost problem for vendors is the recent requirement that they obtain a facility security certification to be considered for processing services contracts. The cost of becoming certified, the fact that certification is not a guarantee of any processing business, and the fact that if business is obtained it will be limited to a maximum three-year contract, can limit vendor interest.

To foster more competition, GSA raised the threshold over which agencies must request GSA Delegation of Procurement Authority to offer contracts to vendors. Separately negotiated contracts are now being more actively pursued by both agencies and vendors.

B

Applications Software Products

Expenditures for packaged applications software will increase 21% annually, growing from $87 million in 1987 to $224 million in 1992. Packages that support distributed data processing and DBMS applications should be the most active sales area. Civil agencies will spend slightly more than defense agencies in 1988—$267 million compared to $223 million.

Packaged systems software is generally acquired with hardware systems. About $212 million will be spent in 1988 for data center management and applications development tools. Tools that enhance programmer productivity will be acquired at a greater rate.

A goal of federal agencies is to approach quasi-commercial systems in the use of standard packages. Although in the past agencies felt their requirements were too specific to be met with off-the-shelf applications, the current emphasis is on acquiring commercially available packages and then modifying them via professional services contracts to retain transportability and maintainability as hardware systems evolve. With this strategy agencies hope to limit the high cost of postimplementation changes that frequently occur with custom-developed software when hardware or personnel change.

These packages, and customer-developed software for that matter, will generally be required to be written in standard languages and for standard operating environments.

- OMB is emphasizing the procurement of COBOL-based financial and personnel systems, although some "high tech" elements such as those in Energy, FAA, NASA, and the Geological Survey will continue to require unique languages.

- The Department of Defense (DoD) has reduced the number of supported languages to five. Although Ada is one of the five—being supported as means of solving DoD's weapons programming inefficiencies by providing a language that all programmers know—there appears

to be more Ada offerings than opportunities, because the Ada market has yet to take off.

- Only C³I and weapons systems use special operating systems.

Prequalifying software and discounting are two vendor strategies that have led to increased market share.

- Some vendors are prequalifying their software by providing it to subagencies for beta testing. The vendor then modifies the software to meet subagency requirements, and the product is then placed on a qualified-products list. Subagencies buying software from that list are faced with shorter acquisition cycles.

- DoD is emphasizing multisite licenses to leverage higher discounts.

- Some vendors are rapidly increasing market share by offering discounts for intraagency purchases.

A major concern for vendors is the newly adopted policy governing the licensing of computer software. In an effort to move acquisitions to a purchase basis, all software currently rented by the government must have been purchased or converted to a Lease-To-Ownership-Plan (LTOP) effective December 31, 1986. Contracts involving installed rental (without automatic ownership) will not be extended or renewed for any period. Rental for new business will no longer be solicited.

LTOP provides for mandatory "purchase option credits" to be accrued to software under license. After a specified period of time, a fully paid, nonexclusive perpetual license for the software product automatically accrues to the government.

Several vendors submitted formal protests to GSA regarding the policy, citing the reductions in competition the policy will likely create as vendors refuse to do business under GSA's terms, the policy's oversight of recurring costs (maintenance and support) usually included in the license fee, and the government's failure to comply with its own requirement that vendors be provided an opportunity to comment before the implementation of any significant policy change. GSA's Board of Contract Appeals determined that sufficient competition exists to support the government's right to insist on ownership or perpetual licenses.

C

Professional Services

INPUT estimates that the federal government professional services market will increase from $3.5 billion in 1987 to $6.3 billion in 1992, an average annual growth rate of 12%. The need for contractor assistance to support the federal government's ADP rebuilding goals will continue to make the federal government professional services the largest single

externally contracted information services segment of the federal sector. The principal components of this market are:

- Software development, also called programming and analysis in the federal sector.
- Systems integration, which includes subsets of consulting, design, engineering, and analysis.
- Facilities management of government owned or leased automatic data processing equipment (ADPE), which includes vendor operation, maintenance, and, sometimes, overall resource management.
- Design and consulting, ranging from special studies to the preparation of specifications of information technology resources required to meet specific government needs.
- Education and training of managers, professionals, and technicians using a range of resources that varies from manuals to computer-based education in automatic data processing.

1. Programming and Analysis/ Software Development

Programming and analysis services, also called software development, include:

- Hardware and/or software system design.
- Custom software development.
- Modification of commercial software products.
- Software testing of custom and commercial packages.
- Software conversion.
- Maintenance of operating and applications software.
- Independent verification and validation (IV&V) of software packages prepared by other vendors.

This service mode is expected to be the second fastest growing during the forecast period, at an AAGR of 11%, and is the largest submode in professional services. The current and continuing shortfall in programming skills of the federal government sector is the most significant factor behind the projected growth. Government staffing limits and the backlog of software maintenance tasks of most government data centers also contribute to the demand for vendor assistance in this service mode.

There is a commitment to maintain and increase the effectiveness of existing software. The major trend will be to buy more off-the-shelf packages and use professional services to modify the packages to suit unique needs.

This segment will remain strong until the agencies retrain or replace their current staffs and resolve the software maintenance problems associated with earlier custom software practices and manual software development procedures.

2. Consulting Services

Consulting services in the federal market provide support to information systems and/or services. Examples of government consulting service contracts are:

- Feasibility studies.
- ADP requirements analyses.
- Systems audits.
- System Engineering and Technical Direction (SETD).
- System Engineering and Technical Assistance (SETA).

Consulting services are expected to increase from $371 million in 1987 to $500 million by 1992, an AAGR of 6%. The primary growth factor is the need of agencies for assistance in producing the technical justification for planned improvements in information technology resources during this period. The agencies are understaffed in the technical planning and evaluation areas.

3. Education and Training

Education and training services relate to information systems and services for the user, including computer-aided instruction (CAI), computer-based education (CBE), and vendor instruction of user personnel in operations, programming, and software maintenance. The government normally contracts for:

- Training programs.
- Books and manuals.
- Seminars.
- Automated training systems.

This submode is expected to attain an AAGR of 9% over the 1987-1992 period. The principal focus of training will be the large number of fourth generation replacement systems of ADP architectures of the IBM System 360-370 era. The dynamics of end-user computing, local area networks, distributed processing, and new software will require retraining of more than half of the current agency ADP workforce.

4. Systems Integration

This service area will grow at an 18% AAGR from $984 million in 1987 to $2.29 billion in 1992. Nearly two-thirds of the expenditures will come from the Defense sector.

Systems integration (SI) tasks that may be contracted in this submode include:

- Systems Engineering and Integration (SE&I).
- Systems Engineering and Technical Assistance (SETA).
- Systems Integration (SI).
- Systems Work Packages (SWP).
- Hardware (and operating systems software) products.

SI is usually associated with custom hardware/software projects, particularly with high-risk efforts such as substantial system upgrades and replacements.

The newer projects include the design and provision of networks to interconnect the main site and off-site components correctly, including appropriate transmission media and supervision equipment.

Substantial education and training efforts, especially where the project involves the replacement of second- or early third-generation systems, have been planned for most of the large programs.

Post-implementation support after the initial system goes on-line will be required to incorporate later changes and to maintain the system until the in-house staff can be trained to the new system level.

The different forms of contracts found in SI awards reflect the government's desire for risk-reduction contracting to lessen "surprises" and reduce the frequent "bad press" associated with large overruns and system failures.

5. Facilities Management/ Operations and Maintenance

Professional services facilities management (PSFM) is also referred to as government-owned/contractor-operated (GOCO). GOCO also includes standalone operations and maintenance (O&M) contracts, which differ from PSFM in that they have less or no direct management /control of the facility. The computing equipment is owned or leased by the government, not the PSFM or O&M vendor; the vendor provides the staff to operate, maintain, and manage the government's facility. Typical contract tasks include:

- Operation, maintenance, and management.
- Operation and maintenance.
- Hardware maintenance.
- Third-party maintenance.
- Software maintenance.
- Site preparation and installation.

This submode is considered a mature market in the federal government. The currently projected AAGR is 8% between 1987 and 1992, reaching the $1.2 billion level in 1992. The civil sector holds an edge in expenditures, but this gap will narrow as the defense sector grows at a 10% AAGR, compared to a 7% civil sector rate. This service could pick up in the outyears of the budget if the ADP workload continues to increase without a corresponding increase in staff.

D

Turnkey Systems

Prepackaged hardware and software products, usually designed to program specific functions, are expected to grow at a 9% AAGR, from $388 million in 1987 to $590 million in 1992.

As in other vertical markets, turnkey systems vendors to the federal government provide the entire system, including applications software and special peripherals, installation of the system, training of client personnel to operate it, and provision of service during the warranty period.

Federal agencies are developing interest in a wide range of packaged systems.

Defense groups in both DoD and DoE actively support the application of computers in aerospace, weapons, vehicles, and hazardous product facilities.

The Defense Department is particularly interested in computer-based trainers and simulators for electronic-device maintenance, including use of videotapes and videodisks.

All agencies are looking for improved graphics generation and automated mapping applications that produce master drawing files for ships and output for tactical reconnaissance missions and intelligence applications.

Cargo and transport scheduling systems, similar to those for industrial truck and ship dispatching, are directly applicable to the needs of a number of agencies.

E

Demographic Analysis

Exhibit II-5 depicts characteristics of the federal government segment and the defense and civil sectors. As noted earlier, this segment is best characterized by its sheer size in terms of space occupied, number of employees, and number of computers.

In addition to the large, well-populated facilities in the greater Washington, D.C. area, the federal government has established a number of large service centers or enclaves in major cities as well as large military installations. All of these centers employ substantial ADP capability but use

contractor support for overloads and major hardware and software improvements.

The largest concentrations of ADPE and its supporting IT workforce are associated with defense, intelligence, citizen services, revenue services, and enforcement.

EXHIBIT II-5

FEDERAL GOVERNMENT: DEMOGRAPHIC ANALYSIS

DESCRIPTOR	SECTOR		TOTAL FEDERAL GOVERNMENT
	DEFENSE	CIVIL	
Buildings "Owned"*** (Thousands)	323	115	438
Occupied Space*** (Millions of Square Feet)	1,929	796	2,725
Employees in 1987* (Thousands)	1,039	1,075	2,114
Revenue Receipts †† ($Billions)			917
Outlays †† ($Billions)	298	726	1,024
Information Technology Budget †† ($ Billions)	8.1	10.8	19
Government Information Technology Workforce† (Thousands)			128
Computers** (Thousands)			22.6

* Excludes 764,590 Postal Service Employees
** Excludes Computers Costing Less than $50,000, as of 1986
*** 1986
† Expressed in FTE (Full-Time Equivalent Employees) in 1988
†† Government Fiscal Year 1988

- Defense IT aggregations are involved in command, logistics, administration, and research.
- Citizen services include Social Security, welfare, health services, recreation, and Veterans affairs.
- Revenue includes most of the Treasury's activities.

By the early 1980s, more than half of the federal inventory of ADPE was made up of minicomputers, that were acquired over the 1978-1982 period. Enhancement of these installations has been a major focus since 1984.

Department of Labor (DoL) and DoD statistics have suggested that more than half of the ADP workforce has not been trained beyond third-generation software and systems. Most ADP education expenditures in the past two years have focused on end-user computing for non-ADP personnel. Salary and job mobility limitations of federal civil service employment are considered prime movers for erosion of the the in-house ADP workforce.

The government IT workforce statistic excludes military and intelligence ADP specialists. Demands for programmer support of embedded and mission-critical computer services, which are excluded from this market analysis, have been projected by government sources at greater than 900,000 unless substantial gains are made in productivity and automation.

Competitive Developments

III

Competitive Developments

Vendors of services and software to the federal government, in general, may be categorized by their exclusivity with federal clients.

- At the one end of the continuum are firms, typically small in revenue size, who work almost exclusively on federal contracts. Many of these firms have expertise in such services as design and engineering or are known for their "body shop" programming and analysis capabilities. This group also includes several major "Not for Profit" firms, colleges and universities, and in-house government data centers with excess capacity, all of whom compete with commercial federal contractors.

- The middle group on the continuum tends to be very large contractors who have very large and separate commercial and federal operations. Although some of these vendors provide a single type of service, most are capable of providing "full service," either by themselves or in concert with one or more partners.

- At the other end of this continuum are vendors who have a federal presence, but whose presence is secondary to a commercial line of business. That is, these vendors contract with the federal government because of a capability, not because they have *a priori* selected the federal marketplace.

Most of the largest vendors to the government are part of the middle group. They derive a significant percentage of their total professional services revenue either directly from the federal government or as sub-contractors to other companies performing work under government contracts.

- This dependency upon the federal government has had a profound effect upon vendors' earnings, management, organizational structure, employees, and the commercial market.

- These government vendors, as well as larger vendors in the first group, tend to attract and recruit into their management ranks a high proportion of ex-government employees who understand how to navigate the complexities and deal with the competitiveness of government procurements.

- These vendors also enjoy a high rate of systems enhancements, extensions, and maintenance contract awards associated with initial awards. Many of these follow-on contracts are awarded on a sole-source, noncompetitive basis due to the vendor's unique experience and knowledge of the recently completed system.

- But all federal contractors, and this group in particular, face an increasingly competitive environment.

Small businesses, minority-owned businesses, and large aerospace vendors represent three types of new competitors that have come to this market from nontraditional quarters.

A Processing Services

The federal processing service market has matured within the past few years in response to a number of technological and strategic changes.

- The ten leading vendors in the federal market are ranked in Exhibit III-1.
  - The top five vendors on the chart account for more than 60% of the expenditures, and the top ten account for more than 78% of the federal market.
  - Several of the leading vendors have acquired smaller vendors and their contracts, thereby increasing their share of the market.
  - Most of the leading vendors offer two or three of the processing submodes of RCS, batch, and facilities management.
- The market has become increasingly price-sensitive as agencies increase ADP volume without a corresponding budget increase.
  - Agencies tend to buy raw computing power under Basic Agreements (BA) in preference to the more expensive, technically supported Multiple Award Schedule Contracts (MASC).
  - Billing algorithms are coming under increasing GSA and GAO scrutiny through in-process audits.
  - GSA is pressuring vendors for larger discounts without guarantees of appropriate transaction volume.

EXHIBIT III-1

RANKING OF TOP FEDERAL PROCESSING SERVICES VENDORS

COMPANY	RANK*
Boeing	1
CDC	2
CSC Infonet	3
MMDS	4
GEISCO	5
McDonnell Douglas/ Tymshare	6
AMS	7
DRI	8
COMNET	9
ITT Dialcom	10

*Based on 1986 Annual Revenues

- Vendors in this market must employ certain strategies to retain their current market share. These strategies include:
  - Offering supported and unsupported computer time schedules.
  - Qualifying for both MASC and BA under the Teleprocessing Services Program.
  - Maximizing client interface for specialized ADP services that can become the basis for a contract outside the TSP.
  - Providing services to systems integration contractors without RCS facilities to add revenue.
  - Tracking all competitors for opportunities to replace their offerings.

B

Facilities Management Services

Facilities management (FM) services are offered in both the processing and professional services modes. A number of vendors provide FM in both modes to the federal government, as indicated in Exhibit III-2.

- As noted in the Exhibit, 16 vendors provided the top 10 market shares in the two FM submodes. Most of these vendors have been providing FM services for a number of years, indicating the need for experience in pricing and managing federal FM projects.

- This market has matured, with a characteristic decline in growth rate and the number of opportunities. Most of the latter are recompetitions of existing contracts.

  - This market is expected to flatten, if not decline, under the early phases of the Gramm-Rudman Act.

  - If the Act or substitute deficit reduction measures remain in force until 1990, this market could increase in the 1988-1990 era as a cost-effective substitute for federal employees.

- The strategies for winning awards and fiscal viability after an award are simplistic, but require rigorous enforcement.

  - Top-notch managers with the capacity for wide span-of-control techniques are essential to reducing overhead.

  - Everyone on the program must be direct-charged, including secretaries, clerks, and drivers, to keep the overhead down.

  - Fringe benefits must be reduced to the legal minimum, since some federal features (number of holidays, for example) are expensive overhead charges.

  - Job descriptions should just meet wage comparison levels of the Department of Labor wage surveys.

  - Separate entities should be used for FM work to employ minimum overhead, G&A, and fee rates.

- The most significant benefit of FM services in the federal market is contract lifetimes. The typical agreement runs for three to five years, with a high incidence of winning the recompetitions. The strategies for winning the contract again include:

  - High performance rating of ongoing work.
  - Workforce stability (minimal turnover).

EXHIBIT III-2

RANKING OF TOP FEDERAL FACILITIES MANAGEMENT VENDORS

COMPANY	PROCESSING FM RANK	PROFESSIONAL SERVICES FM RANK
Electronic Data Systems	1	8
Boeing Computer Services	2	2
Computer Sciences Corporation	3	1
McDonnell Douglas	4	-
Comnet	5	-
TDC	6	-
ADP	7	-
CDC	8	-
GEISCO	9	-
Sterling Software	10	10
LEMSCO (Lockheed)	-	3
UNISYS	-	4
Planning Research Corporation/Kentron	-	5
Martin Marietta	-	6
Bendix Services	-	7
Dynalectron (Dyncorp)	-	9

- Tight cost control to minimize cost creep.
- Bidding what the Request for Proposal (RFP) requires (not what the staff believes).

C Professional Services

The federal government is the largest customer of professional services and thereby attracts the widest range of vendors by size and specialization. Exhibit III-3 indicates the ten leading vendors by market share to the extent that this portion of their federal revenues is identifiable.

- The market is dominated by system houses and hardware firms.
  - These firms require a broad range of in-house or consultant skills to meet systems integration and implementation requirements.
  - Hardware firms are providing systems employing other company hardware that best meets client needs (and price).
  - The systems integration and software development submodes are the largest of the five submodes.
- Competition in the professional services arena is complicated by the continually changing pattern of vendor teams for different programs. Today's bidding partners are tomorrow's competitors and vice versa.
- Bidding strategies for this mode are different from others, except for FM, which was discussed earlier.
  - A primary requirement is availability and commitment of key qualified managers and professionals.
  - There is an increasing tendency toward the use of fixed-price bids on late development and the implementation phases of new or replacement systems.
  - Some specialized small businesses, consulting firms, and academic groups are the key to an award in cases where the agency believes they have the requisite background or functional experience.
  - In-depth support of the main body of employees and managers can be a key criterion.
  - Reputation has high value in this service mode, especially for cost control, management commitment, staff quality, and availability.
  - Knowledge of available and applicable software packages that can be fitted to agency requirements can be a deciding factor in some bids.

EXHIBIT III-3

RANKING OF TOP FEDERAL PROFESSIONAL SERVICES VENDORS

COMPANY	RANK
Computer Sciences Corp.	1
Martin Marietta Data Systems	2
General Motors/Electronic Data Systems	3
Planning Research Corp.	4
BDM International	5
International Business Machines (IBM)	6
UNISYS	7
Science Applications International Corp.	8
Arthur Andersen	9
American Management Systems	10

- A thorough knowledge of government contracting procedures, audit requirements, and bid evaluation processes is essential to maximize proposal scores for negotiated procurements.

- In-depth knowledge of, and exposure to, agency mission and system functional requirements are important elements for establishing credibility with the potential client.

D
Software Products

The software products market of the federal government has demonstrated the same softness in 1987 as the commercial market.

- The independent software package vendors (excluding computer manufacturers) are ranked by market share in Exhibit III-4.
- This ranking includes systems and applications software products.
- The federal agencies buy about 40% of their software and lease the remainder.
  - GSA and DoD are concerned about and demand proof of vendor maintenance of software, regardless of installed location.
  - Some agencies oppose acquisition of copyright-protected software.
- Key strategies for selling software products in the federal arena are not uniformly practiced by all of the successful vendors, but some combinations apply.
  - Discounts for multiple sites within an agency are important.
  - Discounts for multiple agencies within a cabinet-level department also apply.
  - BETA testing of applicable products by key agencies permits placement on the Qualified Products List (QPL) for future accelerated acquisition.
  - Qualification for the GSA Federal Supply Schedules (FSS) sometimes permits uncontested acquisition in small lots. (The "ground rules" for an FSS annual agreement have some serious drawbacks, however.)
    - The vendor must offer product/service discounts as large as those received by the vendor's "best customer," including foreign clients.
    - The vendor must offer a purchase plan or permanent license after a specified rental period.
    - The vendor must offer post-installation service and support on a nearly universal basis.
  - Demonstrated postimplementation support, especially of the "Quick Reaction" (QR) type.

EXHIBIT III-4

RANKING OF INDEPENDENT FEDERAL SOFTWARE PRODUCTS VENDORS

COMPANY	RANK
Software AG	1
ADR (Ameritech)	2
Computer Associates*	3
CINCOM	4
UCCEL*	5
Information Builders	6
Sterling Software	7
Sage Software	8
Oracle	9
Mathematica, (On-line Software Intl.)	10
Pansophic	11

* Merged in 1987

- Availability of the package for several host machines, especially for agencies with a variety of CPUs.
- A continuing client education program to "let them know your products' capabilities." (There is some brand name loyalty evident.)

E

Turnkey Systems

Turnkey systems have a limited popularity in federal circles. Most of the requirements are described as government-unique, but really only deal with unique or sensitive data. Some areas of government activity have employed small- to mid-sized turnkey systems of the kinds provided by the vendors listed in Exhibit III-5.

- Some vendors sell multiple systems to a few agencies, and others sell a specific system to a number of agencies.
  - CAD/CAM applications are principally defense- and energy-oriented.
  - Graphics and drawing control systems have wide applications across a number of agencies.
  - Training systems are heavily concentrated in DoD and NASA, but other agencies are experimenting with trainers and simulators.
- Strategies for success in this service mode vary widely, but all tie to the need to identify a requirement that is not unique. The latter is best satisfied by custom system designs.
  - The application needs some flexibility in input, storage, and output characteristics.
  - Value-added design and software, complete with training and maintenance documentation, are keys to successful sales.
  - Fixed-price sales are essential for leverage, but discounts will be needed to entice large buys.
  - Investment recovery needs to be spread over a number of systems to be competitive.
  - Education of agency technical personnel is essential to provide access and to minimize competition from custom vendors.
  - System houses can be a hidden source of business when they can incorporate turnkey systems in large configurations.

EXHIBIT III-5

RANKING OF TOP FEDERAL TURNKEY SYSTEMS VENDORS

COMPANY	RANK
Federal Data	1
C3, Inc.	2
Computervision	3
Prime	4
Intergraph, Inc.	5
Computer Consoles	6
Gould	7
Harris	8
Tektronix, Inc.	9
Triad	10

Federal Government Information Technology Budget Outlook

IV

Federal Government Information Technology Budget Outlook

A IT Budget Components

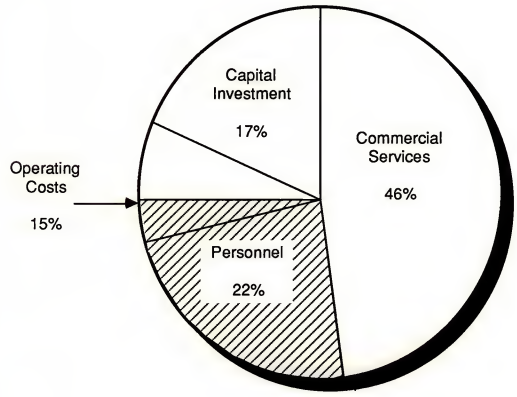
The Information Technology (IT) budget that supports the various departments' missions may be categorized in terms of the basic components needed to acquire and operate Automatic Data Processing (ADP), namely capital investments, commercial services, operating support, and personnel. These categories and their respective shares of the 1988 IT budget are displayed in Exhibit IV-1.

The types of activities supported under each of these categories are as follows:

- Capital Investments. The lease or purchase of all ADP equipment, telecommunications equipment, software, and physical facilities, excluding embedded computers and classified systems.
- Commercial Services. Timesharing services, telecommunications services, facilities management systems design and software development, consulting, software/hardware maintenance, education and training, and other external costs, including requirements analysis, risk analysis, and studies of advanced technology.
- Equipment Lease and Operating Costs. Day-to-day costs of operating information systems, including lease of hardware and software.
- Personnel. Salary, benefits, and travel costs associated with personnel employed directly by the government.

EXHIBIT IV-1

FEDERAL GOVERNMENT INFORMATION TECHNOLOGY BUDGET GFY 1988



Obligations = $18.9 Billion

Contracts = $12.7 Billion (67%)

External Contracts

In-House

Source: OMB A-11 S43 for FY 1988

B

Changes in the IT Budget

As a percentage of the total federal government budget, the 1988 IT budget of $19 billion represents 1.6%. This is about the same proportion as in 1987. Prior years (1982-1985) saw a 33% increase in this fraction.

Although the total IT budget has increased 43% in constant dollars since 1982, the period of rapid growth ended in 1985 with a 20% increase over the previous year. The 1988 increase over 1987 will be 8%.

Increases by type of program are not equal, but rather reflect the current administration's priorities.

- National Security and International Affairs Programs, representing over 50% of the total IT budget, will increase 5% over 1985.
- Economic and Government Administration will increase 1.3%.
- Human Resources, Veterans, and Labor Programs will increase 0.1%.
- Natural Reserves, Energy, and Science efforts will increase 7.1%.

By budget category, the portion of the IT budget available for contracting will decrease to 67%, whereas the in-house portion will begin to increase. The slowest growth area will be capital investment, which will decrease only 3% from the 1987 level.

C

IT Services Contracting Forecast

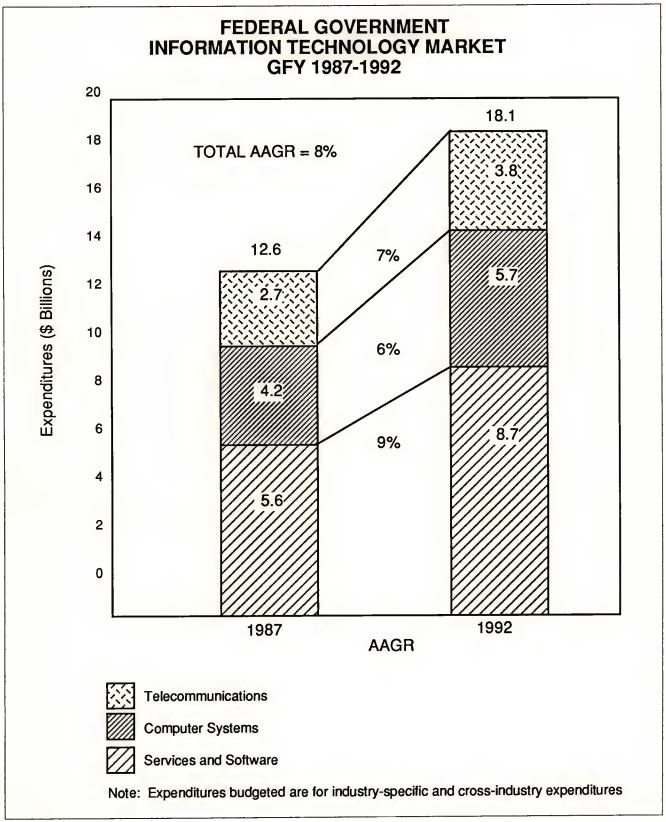
Exhibit IV-2 depicts the contracted information services portion of the IT budget in more detail and provides a forecast by major markets through 1992.

- Although all markets will bear the impact of slower growth in the IT budget—currently forecast at 8% annually—computer systems acquisitions will show the smallest annual growth (6% AAGR). After heavy investments in acquiring, upgrading, or replacing major systems in recent years, only low- and high-end systems will enjoy increased expenditures.
  - At the low end, the government anticipates acquiring over 300,000 microcomputers by 1990.
  - Similarly, at the high end, over 100 supercomputer acquisitions are anticipated for use in the Strategic Defense Initiative ("Star Wars"), weapons research, energy, scientific investigations, weather forecasting, and national laboratories.
- On the other hand, telecommunications, services, and software will grow faster. Telecommunications expenditures will increase as the

government puts in place a new federal system (FTS-2000) to hold the line on rising telecommunications costs created, in part, by the forced divestiture of AT&T.

- Services and software expenditures, the focus of this report, will increase at 9% average annual growth rate (AAGR) in response to agencies' needs to address requirements for increased efficiencies in the face of a shrinking in-house workforce.

EXHIBIT IV-2



Federal Market Opportunities

Federal Market Opportunities

A Application Targets

There are different application needs within an agency and between agencies.

- Major opportunities exist for applications that provide new management information systems. These applications represent upgrades or expansions of capabilities relating to day-to-day operations of federal ADP and represent at least one-fifth of the different application needs of both civil and defense agencies.
- Data management capabilities and data base management systems will become particularly popular as agencies attempt to organize their information resources to meet the ever-growing end-user demands. DoD agencies in particular will require applications in this area.
- Administrative and logistics systems are required to bring these types of applications up to a level of efficiency realized in the commercial marketplace. Although often believed to be an application indigenous to DoD, civil agencies seem to require even more support in this area.
- With increasing congressional pressure on agencies to institute better money management practices, financial management and budget applications have also become target initiatives, particularly in civil agencies.
- Scientific applications are most prevalent in space exploration, energy, weapons development, physical science projects of DoD, Commerce, NASA, and Energy.
- Office automation applications, while commanding a smaller share of the various applications, should be particularly fruitful for vendors who offer solutions for the integration of incompatible hardware and the need for increased end-user support.

B

Software Management

A particular concern surrounding these application targets is software management.

- More than 60 cents of every federal dollar spent on data processing is spent on software. Between 36 and 42 cents of that software expenditure are spent just to maintain existing custom software systems. Agencies are being pressured by budget restrictions to acquire improved software maintenance tools to reduce the large personnel costs associated with maintenance.

- The government has some unique data processing needs that require unique computer applications and software. Many federal computer technology applications are not, however, fundamentally different from those of the private sector and could use available commercial software packages with few, if any, changes.

- The federal bias toward custom development of more than 90% of its software has a high investment cost. Initial development of custom software is lengthy and labor-intensive and subsequent modification is difficult. Utilization of development tools and practices such as software engineering by vendors on government contracts will be emphasized.

- Transitions to more modern, efficient hardware are often inhibited by large inventories of customized software that require conversion. Automated conversion techniques and cross compilers will be needed by conversion vendors to meet price competitions. There are even cases where large modern computer hardware is set up to run like older, less-capable computers so that existing custom software can run on it.

A decade ago, the average life expectancy of a software application was three to five years. Today, five to eight years is considered average.

- Many very large systems used by the federal government are more than 20 years old. Modern software engineering practices were not employed in the development of these older systems. As a result, they are very difficult and extremely expensive to maintain, yet vital to the proper functioning of an agency.

- In some installations, the applications software investment is several times the value of the entire data processing suite.

- Some vendors will be contracted to provide appropriate transitions and maintenance of these systems. Others will provide flexible architectures for the identification and recovery of data in magnetic tape formats generated by systems and code versions no longer in use.

C

Turnkey Systems

There is continuing interest by a number of agencies in the acquisition of turnkey, packaged ADP systems where the available applications, system configuration, delivery time, and/or cost best meet the agency's needs.

Analysis of agency needs can lead to identification of system requirements that can be met nearly or completely by off-the-shelf turnkey systems.

- Vehicle maintenance, overhaul, and replacement systems created for commercial truck, taxi, and rental car fleets are directly adaptable.
- Facility and maintenance resource scheduling systems are equally adaptable.
- Many three-dimensional graphics systems and indexing systems are directly applicable to agency needs.

With relatively minor modifications, a number of commercial turnkey systems can be applied to a range of government needs.

- CAD/CAM systems are nearly universal.
- Warehousing and inventory locater systems can be readily adapted to government systems.

There are some government-unique applications that can be satisfied by either extensively modified commercial systems or systems devised for employment by several agencies.

- ADP-driven trainers for a range of vehicles and services, such as electronic system maintenance, will be required.
- Simulators related to those developed for arcades have applications in a number of both civil and defense agency training facilities.
- Digital mapping systems, an extension of engineering graphics and topology, will be acquired by a number of agencies.

VI

Conclusions and Recommendations

Conclusions and Recommendations

The need for outside contractors to support the services and software requirements of the federal government is evidenced by the increasing budget allocations and the implementation of policies that freeze federal staffing levels and move more information service support functions to the private sector.

The growing opportunities for vendors are not, however, free of business challenges. To be successful, vendors must understand the risks of contracting with the government, be prepared to support the ADP objective of the agencies, and prepare to offer ADP solutions that require multivendor bids. These recommendations, listed in Exhibit VI-1, are discussed below.

A

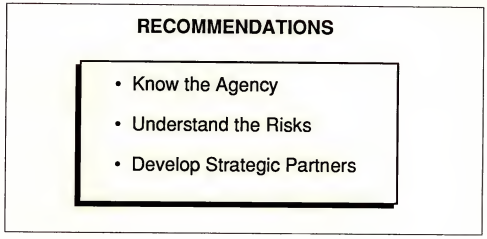
Know the Agency

In any situation where outside services are used after a period of in-house support, there is a tendency on the part of the user to be skeptical of the results. The skepticism may be compounded in the federal government, where a "bottom-line" business orientation has not been a way of life.

Federal government contracting offices are sensitive to these issues. They realize the need (and benefits) of using vendors but have not always been satisfied with the results nor comfortable with the vendor dependence that frequently results.

To develop a full picture of the agency, vendors, particularly those unknown to an agency, should spend considerable time marketing their capabilities to appropriate agency representatives. This must be done during the bid development process, but should also be a standard practice of intelligence gathering performed without regard to specific opportunities.

EXHIBIT VI-1



B

Understand the Risks

As the federal government struggles to improve ADP performance in the face of many constraints, agencies will pass uncertainties and risks on to vendors. Vendors, in turn, must live with the uncertainties and develop means of containing these risks.

There are numerous factors that create uncertainty in at least the funding levels of planned and awarded programs.

- The factors with the most significant potential impact on vendors are directives and policies. The emphasis on contracting out and in particular the use of A-76, new acquisition regulations, information services policies, and trade policies all affect funding and terms and conditions of contracting.

- The availability of government personnel is the second most important risk factor. The shortage resulting from limits imposed by Congress on agency budgets and the lack of sufficient numbers of specialists and managers who support contracting-out could be reversed by strong federal employee union activities.

- Vendors also considered political uncertainty a factor. Elections and the emphasis on changing popular issues impacts ADP spending. The current focus on threats to world peace and the rising budget deficit overshadow technology issues.

- Budget changes, both increases and decreases, and budget policy are other important influences that affect the timing, priority, and near-term funding of projects.

Federal government policies also present risks for vendors.

- Changes in federal procurement/acquisition regulations and level of enforcement can impact vendors positively or negatively.
  - New FIRMRs are expected to be more competitive and to increase the number of vendors in the market at a cost (in lost market shares) to those already in the market .
  - Master Agreement Schedules (MAS) currently stress commercialization, large discounts, and almost universal maintenance support.
  - The Defense Contract Audit Agency has begun to establish burden rates for contractors regardless of previous CAS agreements.
- Deficit reduction measures will not reduce vendor investment costs that are frequently related to long, drawn-out programs that have slippery funding status and repetitive "Best and Final Offer" cycles.
- Federal government agencies employ services contracts to overcome personnel shortages. Vendors are also faced with overcoming labor pool shortages in specific hardware and software systems and/or in particular geographical areas. Failure to resolve these requirements in the pre-bid stage can be expensive in both overhead and management costs after award.
- Continuing changes in national small-business policies and initiatives have affected, and will continue to affect, the revenues of larger vendors and those classified as "small business."
  - Programs and projects earmarked as "Small Business Set Aside" or selected by SBA as an 8(a) program are denied to the slightly larger vendors as well as to the really large firms, reducing their effective market.
  - Failure to identify some fair amount of prospects for small business can have a devastating impact on new/small business organizations.
- Another source of risk is the contracting vehicle. Vendors must resign themselves to the fact that the federal government prefers to do business on a fixed-price basis. Vendors must find and put into practice methods of pricing and managing contracts that allows them to minimize the risk of performance on a fixed-price basis or they will not be able to compete successfully in the government marketplace.

C

Develop Strategic Partners

A changing technology has brought forth a new ADP environment where the focus on the function—rather than the tools—is ever increasing. Manifestations of this impact include a variety of concepts, such as:

- Supersystems that integrate several business functions as well as FGLs, DBMS, and code generators.
- Data bases that range from the personal to the corporate.
- Micro-mainframe links and other extensions to intelligent workstations.
- End-user computing, spawned by proliferating microcomputers with demands for prototyping and unique applications.
- Security, data protection, and privacy systems.

With the promise of widespread automation in mind, agencies are increasing their requirements for multidimensional systems. Few vendors are able to meet these demands by themselves. And, even fewer vendors have the R&D capability to advance their capabilities in newer technologies while spending to capture and successfully complete assignments.

The answer to these challenges lies in strategic partnering. This concept suggests that the unique requirements of a targeted agency or opportunity be used to guide the vendor's selection of products, services, and capabilities needed to satisfy these requirements. Whether the products/services are developed in-house or licensed or purchased from another vendor, the goal is to satisfy the user requirements in a manner that offers the user the appearance of the vendor as a single source of service for a wide spectrum of requirements, including post-award services such as training, documentation, maintenance, and on-going support. By envisioning linkages that make sense to the user, vendors have greater control to shape deals.

There are negatives associated with strategic partnering, however:

- Partnering cannot compensate for fundamental vendor weaknesses and, in fact, may accentuate them by creating mutual dependencies.
- Partnering in a reactive mode clouds the dynamics (positive and negative) that ensue when a company shares a vital part of its business with another, perhaps otherwise competitive, vendor. Such clouding prohibits its management from engendering the intensity and drive that make partnering work.

- Partnering may be a long process that, unless started early, will result in a missed opportunity. Early partnering is critical when the window of opportunity is narrow.

- Partnering sometimes calls for teaming with competitors. These pairings not only violate business instincts but may create conflicts with other parts of the organizations if these groups assess the partnering strategy occurred as the result of their failure to deliver the product/service required by the client agency.

D

Additional Recommendations

Vendors should vertically penetrate potential agency customers to better understand the agency mission and functions and to solve the agency problems, not modify the problem to meet an available solution.

Vendors should be aware that, especially in civil agencies, their reputation is an important factor in whether they can win work with an agency. The government is a "small" community and a questionable reputation can impede getting work in another agency. Overcoming a "poor" reference can take a long time.

It is extremely important that vendors regularly and systematically survey their agency customers to determine problems, satisfaction levels, trends, and opportunities. This survey should not be done through the field staff but by a central organization. In at least part of the survey, an independent third party should be employed to prevent biases and provide objective standards.

Vendors can make more effective use of their marketing budget if they emphasize their marketing in areas that are politically popular. Congress reacts to programs that gain or hold votes, and current budgets are more likely to emphasize domestic issues and spending programs than technology.

Vendors should manage proposal development carefully to ensure containment of the risks of unsuccessful performance.

Vendors should establish strategic partner relationships based on user requirements and should position themselves as a competent, "single-service" vendor.

Appendix: Forecast Data Base

FG-A

Appendix: Forecast Data Base

This appendix contains the following forecast information, as shown in Exhibit FG-A-1.

- Market size by delivery mode for 1986-1992.
- Market growth rates for 1986-1987.
- Average annual growth rate (AAGR) for each delivery mode for the five-year period 1987-1992.

EXHIBIT FG-A-1

FEDERAL GOVERNMENT INDUSTRY SECTOR INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST, 1986-1992

SEGMENTATION BY DELIVERY MODE	1986 ($M)	86-87 GROWTH (Percent)	1987 ($M)	1988 ($M)	1989 ($M)	1990 ($M)	1991 ($M)	1992 ($M)	87-92 AAGR (Percent)
PROCESSING/NETWORK SERVICES									
Remote Comp/Batch	323	8	350	341	357	373	391	408	3
Facilities Management	213	5	223	247	263	286	311	337	9
TOTAL	536	7	573	588	620	659	702	745	5
APPLICATIONS SOFTWARE									
Mainframe/Mini	59	19	70	83	98	124	152	183	21
Micro	15	13	17	20	22	29	35	41	19
TOTAL	74	18	87	103	120	153	187	224	21
TURNKEY SYSTEMS	342	13	388	430	473	512	555	590	9
SECTOR TOTAL	952	10	1048	1121	1213	1324	1444	1559	8
OTHER EXPENDITURE BREAKDOWN									
PROFESSIONAL SERVICES									
Software Development	953	12	1072	1216	1280	1440	1654	1837	11
Consulting	352	5	371	394	434	451	483	500	6
Education & Training	268	11	298	332	367	396	414	449	9
Systems Integration	897	10	984	1189	1400	1636	1916	2285	18
Facilities Management	734	7	788	862	930	998	1074	1180	8
TOTAL	3204	10	3513	3993	4411	4921	5541	6251	12

About INPUT

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